REMARKS

The claims are claims 1 to 4, 7, 8 and 21.

Claims 8 and 21 are amended. Claims 8 and 21 are amended to make clear that the speaker cone and voice coil are aligned around a central axis. Claims 8 and 21 are further amended to recite that the fixed position is radially offset from this central axis. Previous references to first and second units within claims 8 and 21 are replaced with appropriate recitations of the magnetic coil structure or the core structure.

Claims 1 and 2 were rejected under 35 U.S.C. 103(a) as made obvious by the combination of Pulfrey U.S. Patent No. 5,493,620 and Saik et al U.S. Patent No. 4,312,118.

Claim 1 recites subject matter not made obvious by the combination of Pulfrey and Saik et al. Claim 1 recites "said first unit and said second unit disposed coaxially about an axis radially offset from said central axis." Claim 1 earlier recites "a voice coil aligned with the speaker cone along a central axis." This makes clear that the recited central axis is the joint axis of the voice coil and speaker cone. The OFFICE ACTION cites: velocity sensing structure 40 of Pulfrey as making obvious the recited variable reluctance sensor device; annular cylindrical permanent magnet 28 of Pulfrey as making obvious the recited first unit; and voice coil 30 of Pulfrey as making obvious the second unit offset from the axis. Inspection of Figures 1 and 2 of Pulfrey makes clear that velocity sensing structure 40, annular cylindrical permanent magnet 28 and voice coil 30 are coaxial with cone 21. The OFFICE ACTION cites Pulfrey at column 5, lines 5 to 20 as making obvious this limitation. This portion of Pulfrey states:

> "The loudspeaker structure 20 includes a cone 21, a frame or basket 22, webs 23 and 24 and a main electromagnetic structure 25. The main electromagnetic structure 25 includes a

> rear cylindrical iron pole piece 26, an annular cylindrical permanent magnet 27, an inner annular cylindrical iron pole piece 28 and a thin voice coil nonconductive, nonmagnetic support or bobbin 29. A voice coil 30 is fixedly positioned on the bobbin 29. A front annular cylindrical iron pole piece 32 is positioned about the voice coil 30 and spaced radially therefrom. The voice coil 30 is positioned in the air gap defined between the inner annular pole piece 28 and the front cylindrical pole piece 32, the longitudinal extent of the voice coil 30 is such that the same number of turns is always within the air gap, even at maximum deflections in either direction, a configuration usually referred to as 'overhang'."

The only teaching of remotely resembling the "radially offset" recited in claim 1 is "A front annular cylindrical iron pole piece 32 is positioned about the voice coil 30 and spaced radially therefrom." The Applicants respectfully submit that one skilled in the art viewing Pulfrey would understand front annular cylindrical iron pole piece 32 is coaxial with voice coil 30 and cone 21. This corresponds to the recited central axis and not the radially offset axis of the first unit and the second unit recited in claim 1. The OFFICE ACTION cites voice coil 30 as making obvious the second unit recited in claim 1. Voice coil 30 clearly cannot have an axis radially spaced offset from its own axis as required by the language of claim 1. The original application states at page 2, lines 22 and 23:

> "Others have attempted to provide indication of speaker cone motion using a variety of electromagnetic coil structures coaxially arranged with the speaker voice coil."

Contrasting this invention with "structures coaxially arranged with the speaker voice coil" implies that the claimed structure is not coaxial with the speaker voice coil as taught in Pulfrey. Thus Pulfrey fails to make obvious the "said first unit and said second unit disposed coaxially about an axis radially offset from said central axis" limitation. Accordingly, claim 1 is allowable over

the combination of Pulfrey and Saik et al.

The OFFICE ACTION states at page 2, lines 8 to 11:

> "The examiner asserts that Pulfrey's 28 and 30 (read on first and second unit) read on the language as recited (see Figure 2). It is implicit that 28 and 30 are disposed coaxially about an axis."

The Applicant agrees that annular cylindrical permanent magnet 28 and voice coil 30 of Pulfrey are "disposed coaxially about an axis." The language of claim 1 requires more. Claim 1 requires that this axis of the first and second units be "radially offset from said central axis." Pulfrey clearly teaches that annular cylindrical permanent magnet 28 and voice coil 30 are coaxial with the central axis. Thus this teaching of Pulfrey fails to teach the recited "radially offset from said central axis." Accordingly, claim 1 is allowable over the combination of Pulfrey and Saik et al.

Claims 2 and 7 are allowable be dependence upon allowable claim 1.

Claims 3 and 4 were ruled allowable except for dependence upon rejected base claim 1. These claims are now allowable because amended base claim 1 is allowable.

Claims 8 and 21 are rejected under 35 U.S.C. 103(a) as made obvious by the combination of Pulfrey U.S. Patent No. 5,493,620 Saik et al U.S. Patent No. 4,312,118 and Son U.S. Patent No. 7,110,564.

Claim 8 and 21 recite subject matter not made obvious by the combination of Pulfrey and Saik et al. Claims 8 and 21 recite "a voice coil aligned with the speaker cone along a central axis, the fixed position radially offset from the central axis." Claim 8 recites "a magnetic coil structure fixed relative to said fixed position; and a core structure affixed to said speaker cone coaxial

with said magnetic coil structure effecting relative motion between said magnetic coil structure and said core structure through motion of said speaker cone at the fixed position on said cone radially offset from said axis." Claim 21 similarly recites "a core structure fixed relative to said fixed position; and a magnetic coil structure affixed to said speaker cone coaxial with said core structure effecting relative motion between said core structure and said magnetic coil structure through motion of said speaker cone at the fixed position on said cone radially offset from said axis." This makes clear that the recited central axis is the joint axis of the voice coil and speaker cone. The OFFICE ACTION cites: velocity sensing structure 40 of Pulfrey as making obvious the recited variable reluctance sensor device; annular cylindrical permanent magnet 28 of Pulfrey as making obvious the recited core structure; and voice coil 30 of Pulfrey as making obvious the core structure. Inspection of Figures 1 and 2 of Pulfrey makes clear that velocity sensing structure 40, annular cylindrical permanent magnet 28 and voice coil 30 are coaxial with cone 21. The OFFICE ACTION cites Pulfrey at column 5, lines 5 to 20 as making obvious this limitation. This portion of Pulfrey states:

> "The loudspeaker structure 20 includes a cone 21, a frame or basket 22, webs 23 and 24 and a main electromagnetic structure 25. The main electromagnetic structure 25 includes a rear cylindrical iron pole piece 26, an annular cylindrical permanent magnet 27, an inner annular cylindrical iron pole piece 28 and a thin voice coil nonconductive, nonmagnetic support or bobbin 29. A voice coil 30 is fixedly positioned on the bobbin 29. A front annular cylindrical iron pole piece 32 is positioned about the voice coil 30 and spaced radially therefrom. The voice coil 30 is positioned in the air gap defined between the inner annular pole piece 28 and the front cylindrical pole piece 32, the longitudinal extent of the voice coil 30 is such that the same number of turns is always within the air gap, even at maximum deflections in either direction, a configuration usually referred to as 'overhang'."

The only teaching of remotely resembling the "radially offset" recited in claim 1 is "A front annular cylindrical iron pole piece 32 is positioned about the voice coil 30 and spaced radially therefrom." The Applicants respectfully submit that one skilled in the art viewing Pulfrey would understand front annular cylindrical iron pole piece 32 is coaxial with voice coil 30 and cone 21. This corresponds to the recited central axis and not the radially offset axis of the magnetic coil structure and the core structure recited in claims 8 and 21. The OFFICE ACTION cites voice coil 30 as making obvious the coil structure recited in claims 8 and 21. Voice coil 30 clearly cannot have an axis radially spaced offset from its own axis as required by the language of claims 8 and 21. The original application states at page 2, lines 22 and 23:

> "Others have attempted to provide indication of speaker cone motion using a variety of electromagnetic coil structures coaxially arranged with the speaker voice coil."

Contrasting this invention with "structures coaxially arranged with the speaker voice coil" implies that the claimed structure is not coaxial with the speaker voice coil as taught in Pulfrey. Thus Pulfrey fails to make obvious the magnetic coil structure and the core structure "effecting relative motion" between the core structure and the magnetic coil structure "through motion of said speaker cone at the fixed position on said cone radially offset from said axis" limitation. The OFFICE ACTION cites no portion of Saik et al or Son as making obvious this limitation. Accordingly, claims 8 and 21 allowable over the combination of Pulfrey, Saik et al and Son.

The OFFICE ACTION states at page 2, lines 8 to 11:

> "The examiner asserts that Pulfrey's 28 and 30 (read on first and second unit) read on the language as recited (see Figure 2). It is implicit that 28 and 30 are disposed

coaxially about an axis."

The Applicant agrees that annular cylindrical permanent magnet 28 and voice coil 30 of Pulfrey are "disposed coaxially about an axis." The language of claims 8 and 21 require more. Claims 8 and 21 require that this axis of the magnetic coil structure and the core structure be "radially offset from said central axis." Pulfrey clearly teaches that annular cylindrical permanent magnet 28 and voice coil 30 are coaxial with the central axis. Thus this teaching of Pulfrey fails to teach the recited "radially offset from said central axis." Accordingly, claims 8 and 21 are allowable over the combination of Pulfrey, Saik et al and Son.

Claims 8 and 21 recite additional subject matter not made obvious by the combination of Pulfrey, Saik et al and Son. Claims 8 and 21 recite "wherein said electromagnetic coil structure operates as at least part of a high pass filter having a corner frequency" and "said predetermined input signal has a frequency substantially below said corner frequency." The OFFICE ACTION states at page 6, line 13 to page 7, line 6:

> "Pulfrey as modified fails to teach that the electromagnetic coil structure operates as at least part of a high pass filter having a corner frequency. Son discloses an electromagnetic coil structure that operates as at least part of a high pass filter (Figures 2 and 3; column 3, lines 38-52; column 4, lines 33-40). All filters implicitly have a corner frequency. It would have been obvious to modify Pulfrey as modified to have the electromagnetic coil structure operate as at least part of a high pass filter for the benefit of obtaining sound output by which lower frequencies are interrupted to improve sound quality (column 3, lines 25-35).
> "Regarding the input signal having a frequency below the corner frequency language, the examiner asserts that this is a matter of design choice. It would have been obvious to modify Pulfrey as modified so that the input signal has a frequency below the corner frequency for the benefit of meeting a design specification."

The cited teaching of Son differs from claims 8 and 21 in at least two particulars. Claims 8 and 21 recite the magnetic coil structure and not the voice coil as part of the recited high pass filter. Son discloses voice coil 2 and vibrating coil 9. Son teaches the high pass filter includes voice coil 2 and not vibrating coil 9. Thus Son teaches the high pass filter in the opposite structure (voice coil 2) than recited in claims 8 and 21 (magnetic coil structure). Additionally Son teaches supplying an input signal to voice coil 2 that is higher than the high pass filter corner point rather than "a frequency substantially below said corner frequency" recited in claims 8 and 21. Son states at column 4, lines 42 to 45:

> "Also, when a high-frequency current is applied through the lead lines 14 and 15, the high-pass filter constituted as above can interrupt low frequencies in the specific range thereby reducing vibration in sound generation."

Applying a high frequency current to voice coil 2 where the high-pass filter interrupts low frequencies does not make obvious the "frequency substantially below said corner frequency" recited in claims 8 and 21. This portion of Son explicitly acknowledges supply of frequencies above the corner of the high pass filter, thus contrary to the limitation in claims 8 and 21. Accordingly, claims 8 and 21 are allowable over the combination of Pulfrey, Saik et al and Son.

The Applicants respectfully submit that all the present claims are allowable for the reasons set forth above. Therefore early entry of this amendment, reconsideration and advance to issue are respectfully requested.

If the Examiner has any questions or other correspondence regarding this application, Applicants request that the Examiner contact Applicants' attorney at the below listed telephone number and address to facilitate prosecution.

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Respectfully submitted,

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